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Notes on the Naiad Fauna of Northeastern Iowa.

S. W. GEISER.

In this paper are embodied the results of careful and extensive investigations carried on by the writer in the northeastern part of the state of Iowa during the past three years. The collections made, now in greater part in the Museum of the Upper Iowa University, have been made chiefly from three rivers in this section. The Wapsipinicon, a large, sluggish prairie stream with a bottom varying from the mud of the slough bottom, to sandy, gravelly, or even stony bottoms—has been systematically examined from Quasqueton, in Buchanan County, to Fairbank, in the extreme northwest portion of that county, a distance of about thirty-five miles, while occasional collections have been made as far north as Chickasaw County. The Turkey has been collected from at various points, notably at Elgin. In general characters the Turkey resembles the Wapsipinicon, but it is not nearly as large and it is also much more rapid. From the Volga, collections have been made from about fifteen miles of its course. These collections, augmented by contributions and exchanges from other streams in northeastern Iowa, gave me a fair basis for work. Specimens upon which this study is founded are contained in the Museums of the Upper Iowa University and the Chicago Academy of Sciences.

It is believed that the notes here presented may be of interest, since the work that has hitherto been carried on in the study of Naiades of Iowa has been rather confined to southern and southeastern Iowa. For whatever we know of the distribution of the freshwater mussels appearing in the state, we are indebted to a number of naturalists. Lea¹ (1857) and Pratt² (1876) described new species from the waters of the state, and general catalogues have been prepared by Witter³ (1878)

(1) Proc. Acad. Nat. Sci. Phila. IX: p. 84. (1857).

(2) Proc. Dav. Acad. Sci. 1876: pp. 167-168.

(3) Quart. Journ. Conch. 1878: pp. 385-394.

* October 15, 1910.—Pages 229 to 244.

and Keyes⁴ (1888). Other papers by Pratt⁵, Tryon⁶, Call⁷, Shimek⁸, H. M. Smith⁹ and Kelley¹⁰, etc., cast further light on limited areas. The latter and more recent catalogue of the naiades of Iowa, which was based on previous work as well as on original investigation, enumerates 66 "species" of Unionidæ which Keyes includes in the following genera: ANODONTA, 11; MARGARITANA, 7; UNIO, 48. A number of the enumerated species have since been reduced to the synonymy of other forms, but we believe that the number of reported species will be increased upon a more thorough examination of the streams of the state. From a study of his localities, it is apparent that the work of Keyes was confined to the Mississippi, Iowa, Cedar, Des Moines, Raccoon, Missouri, Rock (Northwestern Iowa), and Shell Rock rivers, and to Okoboji and Spirit Lakes, and some of his statements as to the distribution of certain Uniones will have to be modified as the result of subsequent investigations.

To the following specialists we are indebted for literature, material, advice and help: Mr. Frank C. Baker, Curator of the Chicago Academy of Sciences; Dr. Paul Bartsch, of the Division of Mollusks of the United States National Museum; and to Dr. R. Ellsworth Call of the De Witt Clinton High School, New York City. To Mr. Hartness de W. Taylor, the writer is greatly indebted for valuable services rendered in the field.

List of Species.

FAMILY UNIONIDÆ, FLEMING, 1828.

GENUS LAMPSILIS RAFINESQUE, 1820.

1. *L. alatus* (Say, 1816) Baker, 1898.
Occurs quite rarely in the Wapsipinicon and Turkey rivers.
2. *L. anodontoides* (Lea, 1834) Baker, 1898.
Common in the Wapsipinicon.
3. *L. ellipsiformis* (Conrad, 1836) Simpson, 1900.
Volga river at Fayette; Wapsipinicon river at Independence and various other localities.

(4) Bull Essex Inst. XX: pp. 61-83. (1888).

(5) Proc. Dav. Acad. Sci. 1876: pp. 165-167; *ibid.* 1878: pp. 156-162.

(6) Am. Jour. Conch. 1865: pp. 68-70.

(7) Bull. Des M. Acad. Sci. I: pp. 5-57. (1885).

(8) Conch. Exch. 1888: p. 114.

(9) Sci. Amer. Aug. 5, 1899: pp. 86-87, w. figs. Bull. U. S. Fish Com. 1898: pp. 289-314, w. 31 pls.

(10) Proc. Ia. Acad. Sci. VIII: pp. 81-84. (1900).

4. *L. fallaciosus* (Smith, 1899) Simpson, 1900.
Occurs somewhat abundantly in the Wapsipinicon at Independence.
5. *L. higginsii* (Lea, 1857) Simpson, 1900.
One male example of this puzzling species found in the Wapsipinicon at Independence.
6. *L. gracilis* (Barnes, 1823) Baker, 1898.
Rare: Wapsipinicon River.
7. *L. ligamentinus* (Lamarck, 1819) Baker, 1898.
The most common species in the area examined.
8. *L. luteolus* (Lamarck, 1819) Baker, 1898.
Common to all drainage systems in this section, usually in company with the preceding species.
9. *L. parvus* (Barnes, 1823) Baker, 1898.
Very abundant locally in the Wapsipinicon at Independence.
10. *L. rectus* (Lamarck, 1819) Baker, 1898.
Common: Wapsipinicon and Turkey rivers.
11. *L. ventricosus* (Barnes, 1823) Stimpson, 1851.
A large, almost rayless, ovate form occurs in company with smaller, thinner individuals of this very variable species in all three river systems;—this latter form resembles Call's figure of "*Unio subovatus*" in his paper on the Mollusca of Indiana,* but his figure shows the beaks as angular, a character which he declares constant. In all specimens collected by us, the beaks are evenly rounded. The ovate form seems to be connected by intermediate links with the smaller, broadly rayed form. Very abundant.

GENUS *PLAGIOLA* RAFINESQUE 1820.

12. *Pl. donaciformis* (Lea, 1828) Baker, 1898.
Wapsipinicon: rare.
13. *Pl. elegans* (Lea, 1831) Baker, 1898.
Occurs rarely in the Wapsipinicon.

GENUS *TRITOGONIA* AGASSIZ, 1852.

14. *Tr. tuberculata* (Barnes, 1823) Simpson, 1900.
Very rare: Wapsipinicon river at Fairbank.

GENUS *STROPHITUS* RAFINESQUE, 1820.

15. *St. edentulus* (Say, 1829) Conrad, 1853.
Not common: Wapsipinicon river.

* 24th An. Rept. Dept. Geol. and Nat. Hist. Indiana, pp. 335-536, w. plates. (1899).

GENUS *ANODONTA*, BRUGUIERE 1792.

16. *A. grandis* Say, 1829.
The nacre of the species, which is normally bluish white, is often excessively roughened and salmon colored, a pathologic condition brought about by the work of a parasitic trematode. Other species of *Anodonta*, as well as *Symphynota costata* have been observed as similarly affected. Lea's *A. salmonia* is merely *A. grandis* thus diseased. This species is common to all streams of Iowa.
17. *A. corpulenta* Cooper, 1834.
Common in the Wapsipinicon and Turkey, usually in company with the preceding species.
18. *A. imbecillis* Say, 1829.
Collected only in the Wapsipinicon at Independence, where it is common in the slough near the Second bridge. Professor Arey also reports this species from the Cedar River at Cedar Falls.

GENUS *ANODONTOIDES* SIMPSON, 1898.

19. *Ano. ferussacianus* (Lea, 1834) Baker, 1898.
Occurs in all the rivers of northeastern Iowa.

GENUS *SYMPHYNOTA* LEA, 1829.

20. *S. complanata* (Barnes, 1823) Lea, 1830.
Very common in the Wapsipinicon and Turkey rivers. In the former stream, the species attains a diameter of from six to eight inches.
21. *S. compressa* Lea, 1829.
Dead shells referable to this species are found quite abundantly along the Volga at Fayette, but thus far we have obtained no living animals. Keyes gives as the results of his work on the mollusca the following locality: "A few specimens taken in the Des Moines River at Des Moines: very rare."
22. *S. costata* (Rafinesque, 1820) Simpson, 1900.
Abundant: Wapsipinicon, Volga, and Turkey Rivers.

GENUS *ALASMIDONTA* SAY, 1818.

23. *Alas. calceola* (Lea, 1830) Simpson, 1900.
Found quite abundantly in the Volga at Fayette and Lima.
24. *Alas. truncata* B. H. Wright, 1898.
Wapsipinicon, abundant; Volga, at Fayette, a few dead shells found.

GENUS *UNIO* RETZIUS, 1788.

25. *Unio crassidens* Lamarck, 1819.
Occurs rather sparingly in the Wapsipinicon at Independence. Hitherto reported only from the Iowa and Mississippi rivers.
26. *Unio gibbosus* Barnes, 1823.
Represented by numerous specimens from the Wapsipinicon.

GENUS *QUADRULA* RAFINESQUE, 1820.

27. *Qu. coccinea* (Conrad, 1836) Baker, 1898.
Occurs sparingly in the Turkey, Wapsipinicon, and Volga drainage systems.
28. *Qu. lachrymosa* (Lea, 1828) Baker, 1898.
Wapsipinicon: rare.
29. *Qu. plicata* (Say, 1816) Baker, 1898.
Very abundant in the Wapsipinicon. It is found in the Volga, nor have we seen any specimens from the Turkey.
30. *Qu. pustulosa* (Lea, 1831) Baker, 1898.
Wapsipinicon: rather rare.
31. *Qu. rubiginosa* (Lea, 1829) Baker, 1898.
Wapsipinicon: abundant; also found in the Turkey and Volga rivers.
32. *Qu. undulata* (Barnes, 1823) Baker, 1898.
This species occurs not rarely in the Wapsipinicon. It is readily distinguished from the closely related *Qu. plicata* by the greater inflation of the shell and prominence of the beaks in that species. In *Qu. undulata* the shell is rather compressed and the beaks are low.

Independence, Iowa,
May 30, 1910.

New Plants from North Dakota. II.

J. LUNELL.

Gutierrezia Greenei sp. nov.

Radix ligneus longitudine variabilis, plerumque autem brevis, caudice crasso ligneo (uno vel duobus) caules protinus emittente, vel ramis plerisque ligneis e superficie superiore caudicis oriundis, qui caules singulos usque quaternos gerunt. Caules 1-3 dm. alti, herbacei, scabri, in caudice confertissimi,